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Economics and Property Law

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Abstract. This essay shows how the economics of property rights can be used to understand fundamental features of property law and related extra-legal institutions. It examines both the rationale for legal doctrine and the effects of legal doctrine regarding the exercise, enforcement, and transfer of rights. It also examines various property rights regimes including open access, private ownership, common property, and state property. Property law is understood as a system of societal rules designed to create incentives for people to maintain and invest in assets, which in turn leads to specialization and trade.

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Property law is the body of court enforced rules that governs the establishment, use, and transfer of rights to land and those assets attached to it such as air, minerals, water, and wildlife. In economic terms, property rights are defined as the (expected) ability of an economic agent to freely use an asset (Allen, 1999; Barzel, 1997; Lueck and Miceli, 2006; Shavell, 2004) and represent a social institution that creates incentives to use, to maintain, and to invest in assets. Property rights may or may not be enforced by courts; and because the actions of courts are costly legal rights are but a subset of economic property rights. In addition to law and regulations, property rights may be enforced by custom and norms (see, for example, Ellickson, 1991) and by markets through repeated transactions.

Property rights, transaction costs, and the Coase Theorem

Consider Coase's (1960) famous example of the rancher and farmer. The rancher's cattle stray onto the farmer's land causing crop damage. The rancher's profit, $\pi(h)$ and the amount of crop damage $d(h)$ are functions of the rancher's herd size h, so the first-best optimal herd size, h^*

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maximizes $\pi(h)-d(h)$ and h^* solves $\pi'(h)=d'(h)$. This is also the choice made by a single farmer-rancher, Coase's 'sole owner' case. If the rancher initially has the economic (and legal) right to impose crop damage without penalty, he would choose the herd size to maximize $\pi(h)$, adding cattle until $\pi'(h)=0$, which implies $h^r > h^*$. The farmer would be willing to pay up to $d'(h)$, his marginal damage, for each steer that the farmer removes from the herd in order to avoid crop damage, while the rancher would accept any amount greater than his marginal profit, $\pi'(h)$.

If transaction costs are zero, the parties will instantly contract to reduce the herd to the efficient size. The farmer will purchase the rights to the straying cattle, and if the farmer had the initial rights the situation would be reversed: either way the outcome is first-best. This is the Coase Theorem: *When transaction costs are zero the allocation of resources will be efficient regardless of the initial assignment of property rights.* But transaction costs are not zero and thus property rights are not perfectly defined (Allen, 1999; Barzel, 1997; Lueck and Miceli, 2006 so property law becomes important in defining rights and determining the allocation of assets. Indeed, Coase's (1960) discussion of nuisance law suggests an economic logic to the law in its assignment of property rights among various parties to these disputes.

Property rights: taxonomy and models

Property law recognizes several fundamental property rights regimes: private property, open access, common property, and state property (Lueck and Miceli, 2006). Property law also recognizes mixed regimes. Consider a fixed asset (such as a plot of land) used with a variable input (x) to produce a market output ($Y=f(x)$). If the input price is w, then the first-best use ($x^*(w)$) must maximize $R=f(x)-wx$ and satisfy $f'(x)=w$. The first-best value of the land is $V^* = \int_0^{\infty} R^*(x^*,t)e^{-rt}dt$, where r is the discount rate.

If there is 'open access' for n individuals, then output is $Y = f(\sum_{i=1}^{n} x_i)$ where x_i is the effort of the i^{th} individual, $f'(\cdot) > 0$ and $f''(\cdot) < 0$, and the opportunity cost of effort is w_i. Each person can only capture (and own) the output in proportion to his share of effort, so each solves:

$$\max_{x_i} R_i = f^i(x_i) \quad w_i x_i \quad \text{subject to } f^i = \left[x_i \Big/ \sum_{i=1}^{n} x_i\right] f\left(\sum_{i=1}^{n} x_i\right) \tag{1}$$

On the assumption that users are homogeneous ($w_i = w_j$. for all $i \neq j$), the Nash open access equilibrium is $x = x^{oa}(n.\ w_1.\ \ldots.\ w_n)$, which satisfies

$$\left(n - 1/n\right)\left(f(\sum_{i=1}^{n} x_i) \Big/ \sum_{i=1}^{n} x_i \right) - \left(1/n\right) f'(\sum_{i=1}^{n} x_i) = w_{i,} \quad i = 1,...,n. \tag{2}$$

In the limiting case as $n \to \infty$, (2) becomes $f(\sum_{i=1}^{n} x_i) / \sum_{i=1}^{n} x_i = w$ which is the famous 'average product rule' (Gordon, 1954; Cheung, 1970; Brooks et al., 1999). The limiting case implies that rents are completely dissipated, or $\sum_{i=1}^{n} R_i = \sum_{i=1}^{n} \left[f^i(x^{oa}) - wx^{oa} \right] = 0$ and the present value of the asset is also zero, $V^{oa} = \int_0^{\infty} R(x^{oa}, t) e^{-rt} dt = 0$. With heterogeneous costs, the infra-marginal users earn rents and have incentives to maintain open access regime (Libecap, 1989).

With private property the owner chooses $x^* < x^{oa}$ and generates $V^* > V^{oa} = 0$. Private ownership also creates incentives for optimal asset maintenance and investment (Bohn and Deacon, 2000). Let future output be $Y_{t+1} = f(x_t)$, where x_t is current investment, available at a market wage of w. and the interest rate is r. The first-best use of the input (x_t^*) must maximize $R = f(x_t)/(1+r) - w_t x_t$ and satisfy $f'(x_t)/(1+r) = w_t$. If $\pi \in [0,1]$ is the probability of expropriation (because of imperfect rights) of the future output, then an owner will maximize $R = f(x_t)\,[(1-\pi)/(1+r)] - w_t x_t$. The solution ($x_t^{\pi} < x_t^*$) satisfies $f'(x_t)\,[(1-\pi)/(1+r)] = w_t$ and implies less than first-best investment. Pure open access means that no investor could claim future output ($\pi = 1$), so $x_t^{oa} = 0$, and the rent from investment also equals zero. This lack of incentive to invest is essentially the problem of the 'anti-commons' described by Heller (1998) and formalized by Buchanan and Yoon (2000).

Common property is exclusive ownership by a group and may arise out of explicit private contracting (for example, unitized oil reservoirs) or out of custom (for example, common pastures); it may have legal (for example, riparian water rights) or regulatory (for example, hunting regulations) bases that have implicit contractual origins. Common property is well documented for natural resource stocks in less developed economies (Bailey, 1992; Ostrom, 1990). It is also seen in modern 'common interest communities' (such as condominiums, homeowner's associations) where residents use quasi-governments to maintain common areas (such as pools, open space) and provide local public goods (Dwyer and Menell, 1998).

Contracting to form common property creates a group that can realize economies of enforcing exclusive rights. Equal sharing is a typical internal allocation rule; it avoids costs of measuring and enforcing individual use but still leads to overuse compared with first-best. With equal sharing rules a homogeneous membership maximizes the present value of a common property resource (Lueck, 1994; 1995).

Governments own vast amounts of land, buildings, and capital equipment. State property rights are governed by administrative agencies, and the range of property rights regimes incorporates aspects of the three major types: private property, common property, and open access. State property rights commonly – and often severely – limit the transferability of rights, perhaps to limit the moral hazard incentives of agency bureaucrats. The relevant law for state property has its origins in common law (for example, mining on federal land is a first-possession rule) but is primarily governed by statutes and regulations, all shaped by bureaucrats, interest groups, and politicians.

Real property regimes tend to mix the four fundamental types: open access, private property, common property, and state property (Barzel, 1982; 1997; Eggertsson; 1990; Ellickson, 1993; Kaplow and Shavell, 1996; Merrill and Smith, 2000; Rose, 1998; Stake, 1999), implicitly recognizing that assets are a collection of valuable attributes. A rancher's land is not typically completely private: the streams running through the property may be open access for fishing or recreation; the grass may be a lease from a federal agency with mineral rights held by yet another private party. Similar scenarios are found in residential and commercial real estate, and Bailey (1992) found a mixture of ownership regimes among aboriginal peoples. Smith's (2000) study of the common field system of medieval Europe is a rare study of the underlying economic logic of a mixed property regime.

Origin of property rights

In law and custom, first possession is the dominant method of establishing rights, be it to the *flow* of output from a *stock* or to the stock itself (Lueck, 1995). Let $R(x(t))$ be the flow of benefits from an asset, where $x(t)$ is a variable input supplied at time t, r is the interest rate, and $g < r$ is the rate at which $R(t)$ grows over time. The first-best, full-information outcome is

$$V^{FB} = \int_{t=0}^{\infty} R(x^*(t))e^{-(r-g)t}dt, \tag{3}$$